

REMARKS

Claims 1, 3-7, 9-12 and 14-22 are being resubmitted. Claims 1, 3-5, 7, 9-10, 12, and 14-16 have been amended. Claims 2, 8, and 13 have been canceled.

Claims 1, 2 and 12 were objected to as using unclear language. Claims 16-19 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite. The Office Action also rejected Claims 1-3, 5-9, 11, 15, and 20-22 under 35 U.S.C. 103(a) as being unpatentable over Lippert et al. in view of Marshall. The Office Action further rejected Claims 4, 10, 12-14, and 16-19 under 35 U.S.C. 103(a) as being unpatentable over Lippert et al. in view of Marshall, further in view of DeLeon.

Examiner Interview

On March 03, 2003, a telephone interview was conducted between the Examiner and Applicant's representative. A proposed draft of the present amendment was discussed. Also discussed were the references U.S. Patent Application No. 2002/0024495 A1 (Lippert et al.), U.S. Patent Application No. 2002/0130982 A1 (Marshall), and U.S. Patent No. 6,301,050 B1 (DeLeon). No agreement was reached.

Claim Objections

Claims 1 and 12 have been amended to address the objections. Claim 2 has been canceled.

Section 112 Rejections

Claim 16 has been amended to address the Section 112 rejection. Since Claims 17-19 depend on Claim 16, no further amendment of these Claims is necessary to address the Section 112 rejection.

Section 103(a) Rejections

Claims 1, 3-5, 7, 9, 10, 12, and 14-16 have been amended, Claims 2, 8, and 13 have been canceled to address the Section 103(a) rejections.

Lippert et al.

Lippert et al. teach a display apparatus that includes a night vision goggle and an infrared source. The infrared source comprises a scanned light beam display that includes a scanning system and an infrared light emitter. The infrared source receives an image signal from control electronics that indicate an image to be viewed. The control electronics activate the light emitter and the light emitter emits modulated light having an intensity corresponding to the desired image. Simultaneously, a scanning mirror within the scanning system scans the modulated light through a substantially raster pattern onto an image intensifier tube of the night vision goggles (paragraph [0013]). In response to the incident infrared light, the image intensifier tube outputs visible light for viewing by a user (paragraph [0014]). Lippert et al. further teach several embodiments for the scanning system as well as the use of non-visible radiation sources at a plurality of wavelengths to selectively activate wavelength selective phosphors. Therefore, the Office Action argues that the present invention would have been obvious over Lippert et al. in view of Marshall, further in view of DeLeon.

The present invention as in Claims 1, 3-7, 9-12 and 14-22 (as amended) teaches a training system and method for teaching the use of night vision goggles including an image simulation system and a communication system. Multiple infrared computer radiated terrain (CRT) images with combining optics and weighted density filters provide stimulation of night vision goggles. The output of three CRTs is optically combined through appropriately weighted neutral density filters corresponding to the digital weighting of each 12 bit portion of the 36 bit irradiance data. Each computer radiated terrain image is driven by successively higher order bytes of digital video. Three 12-bit video signals are provided, each allocated to a different portion of the entire natural nighttime terrain irradiance range. Therefore, an increased dynamic range of irradiance is provided to an image intensifier tube of the night vision goggles. The resulting image at the output of the image intensifier tube is then scan converted by a high-resolution 12-bit video camera to preserve its resolution and dynamic range. The image is now ready for display on simulated night vision goggles or on a screen using a high-resolution projector. Further, the present invention discloses a head tracking system sensing the head orientation of the person undergoing training.

The Claims 1 and 12 have been amended to include the elements of Claims 2 and 13, now canceled. The Claims 1, 3 and 12, 14, and 15 have been further amended to include the elements: "a pair of simulated night vision goggles"; "weighted neutral density filters"; "three 12-bit video signals" in connection with a further element "an image intensifier tube" to further distinguish over the cited reference of Lippert et al. Claim 7 has been amended to include the limitation of "optically combining the output of three computer radiated terrain images through weighted neutral density filters for providing sufficient irradiance to an image intensifier tube" to further distinguish over Lippert et al.

Although Lippert et al. teach a scanning system, the scanning system of Lippert et al. scans modulated light onto an image intensifier tube (paragraph [0013]) while the present invention discloses a system for scan converting a resulting image at the output of an image intensifier tube for display using a high-resolution video camera (Claims 1, 3, 4, 12-16, as amended). Therefore, the scanning process provided by Lippert et al. is different from the scanning process of the present invention as in Claims 2-4 and 12-16, as amended. Further, Lippert et al. disclose briefly the use of a video camera for generation of images (paragraph [0076]), while Applicant discloses the use of a video camera for scan converting a resulting image at the output of an image intensifier tube as in Claims 4, 12-14, and 16-19, as amended.

Therefore, Lippert et al. do not make obvious the present invention as in Claims 1, 3-7, 9-12 and 14-22 (as amended), either alone or with the other references of record.

Marshall

Marshall teaches an apparatus for providing a simulated night vision goggle display comprising a reflective micro-display for illuminating a night vision goggle, means for tracking the attitude of the night vision goggle, and an image generator for providing infrared images. The image generator has a first channel which is used to drive the reflective micro-display with a high level of illumination, a second channel which is used to drive the reflective micro-display with a medium level of illumination, and a third channel which is used to drive the reflective micro-display with a low level of illumination. Therefore, the Office Action argues that the present invention as claimed in Claims 1-3, 5-9, and 20-22 would have been obvious in view of Lippert et al.

Although Marshall teaches an image generator having three channels to drive a reflective micro-display with a high, medium, or low level of illumination he does not teach or suggest the use of three 12-bit video signals as claimed in the present invention (independent Claims 1, 7, and 15, as amended). Further, Marshall discloses that due to the pulse width modulated method of modulation coupled with the field sequential display of "colours" in the panel 12, simultaneous use of extreme dark and bright is not possible (paragraph [0026]). By using 12-bit video signals and optically combining the output of three computer radiated terrain images through weighted neutral density filters, as in independent Claims 1, 7, and 15 (as amended) an increased dynamic range needed to simulate direct viewing of bright lights is provided. Further, Marshall teaches the use of a LEDs (paragraph [0025]) where the present invention as in independent Claims 1, 7, and 15 (as amended) teaches the use of computer radiated terrain images.

Therefore, Marshall does not make obvious the present invention as in Claims 1, 3-7, 9-12 and 14-22 (as amended), either alone or with the other references of record.

DeLeon

DeLeon teaches an image enhancement system for scaled viewing of surrounding object in conditions of low light. This system comprises a camera system to provide an enhanced image of a viewed object. Objects can be viewed on LCD screens (col. 4, lines 14-33). A high intensity waveform illuminator is used to illuminate the object being viewed. Therefore, the Office Action argues that the present invention as claimed in Claims 4, 10, 12-14, and 16-19 would have been obvious over Lippert et al. in view of Marshall, further in view of DeLeon.

Claims 4, 10, and 12, and 14-16 have been amended to further distinguish over the cited reference DeLeon. Claim 13 has been canceled.

Since DeLeon teaches a camera system for viewing a real object in condition of low light it would not have been obvious to use such a camera system for scan converting a resulting image at the output of an image intensifier tube as disclosed in the present invention (Claims 4, 10, 12, 14, and 16-19, as amended).

Therefore, DeLeon does not make obvious the present invention as in Claims 4, 10, 12-14, and 16-19 (as amended), either alone or with the other references of record.

Prior Art Not Relied Upon

The Office Action notes Nestorovic et al., Wynn, Witt, III, and Streid as prior art made of record but not relied upon as being considered pertinent to applicant's disclosure by showing various features of the invention.

Applicant respectfully submits that the references cited but not relied upon are not believed to anticipate or make obvious the present invention since the references teach different techniques for generating and viewing of images from those disclosed in the present invention. Cited references do not teach the use of digital video signals for generating images as well as a high-resolution video camera for converting the image from the output of the image intensifier tube for display.

CONCLUSION

Reconsideration and withdrawal of the Office Action with respect to Claims 1, 3-7, 9-12 and 14-22 is respectfully requested.

In the event the examiner wishes to discuss any aspect of this response, please contact the attorney at the telephone number identified below.

Respectfully submitted,

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